THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method for representing the behaviour of a system having at least one element, said system having

one or more generic descriptions each comprising predetermined characteristics that affect the behaviour of one or more elements of said system in a predetermined environment, and

a data file that contains one or more sets of numeric data and/or syntactic key words both related to said predetermined characteristics and/or a user defined algorithmic expressions, said method comprising the steps of:

a) calculating for a given interval using said generic description the behaviour of said system using data obtained from said data file; and

c) when said calculation does not use numeric data or a syntactic key word from said data file said user defined algorithmic expression is used to calculate the behaviour of said system.

2. A method according to claim 1 wherein said predetermined characteristics are defined by equations of motion based on a predetermined number of degrees of freedom of motion.

3. A method according to claim 1 wherein said calculations include an interval step integration of the one or more elements in said system using one or more of said contents of said data file.

4. A method according to claim 3 wherein said interval is time.

5. A method according to claim 4 wherein said calculation includes at least one derivative function and at least one time-step numeric integration method.

6. A method according to claim 5 wherein a said integration method is used once every time-step.

7. A method according to claim 6 wherein said derivative function is used by said integration method one or more times every time-step.

8. A method according to claim 7 wherein following each time-step an array of one or more pointers to integration variables is updated allowing further integration variables to be created between time-steps.

9. A method according to claim 5 wherein said integration function comprises a predetermined number of system element generic descriptions.

10. A method according to claim 9 wherein said predetermined numbers of system element generic descriptions are ordered for use by said derivative function.

11. A method according to claim 10 wherein when an element specific parameter in said calculation is required, reference is made to data in said data file.

12. A method according to claim 1 further comprising the step of:

d) managing the flow of data to and from said calculating step with a data manager.

13. A method according to claim 12 wherein said data manager controls the reading of data from said data file and the placing of that data on a virtual data bus.

14. A method according to claims 13 and 10 wherein when an element specific parameter in said calculation is required, reference is made to data on said data bus.

15. A method according to claim 1 wherein said user defined algorithmic expression comprises arbitrary logic having dependence on none, one or more sets of numeric data and/or syntactic key words.

16. A method according to claim 15 wherein element specific parameters are defined in a said user defined algorithmic expression and comprise executable mathematical equations and respective data relating to a specific class of element.

17. A method according to claim 16 wherein said mathematical equations are guidance laws specific to a said class of element.

18. A method according to claim 1 wherein the result of said calculation step is numeric values representative of the behaviour of said system.

19. A method according to claim 1 wherein said calculation step runs as a C++ class and is an object containing the required processing including said generic description.

20. A method according to claim 19 wherein said C++ class member functions provide entry points to set the initial values of predetermined characteristics and initiate the choice of data from said data file.

21. A system for providing numerical output representative of the behaviour of a system comprising:

a first data storage means containing one or more generic system descriptions each having predetermined characteristics that affect the behaviour of said system in a predetermined environment;

a second data storage means containing at least one data file that contains one or more numeric data sets and/or one or more syntactic key words related to said predetermined characteristics and one or more user defined algorithmic expressions; and

a calculating means for using said first and second data storage means, wherein calculation using said generic description to obtain said behaviour of said system uses data obtained from said data file; and when said calculation does not use numeric data or a syntactic key word from said data file, said user defined algorithmic expression is used to calculate the behaviour of said system to provide said numerical output.

22. A system according to claim 21 wherein said predetermined characteristics are defined by equations of motion based on a predetermined number of degrees of freedom of motion.

23. A system according to claim 21 wherein said calculations include an interval step integration of the one or more elements in said system using one or more of said contents of said data file.

24. A system according to claim 22 wherein said interval is time.

25. A system according to claim 23 wherein said calculation includes at least one derivative function and at least one time-step numeric integration method.

26. A system according to claim 24 wherein a said integration method is used once every time-step.

27. A system according to claim 25 wherein said derivative function is used by said integration method one or more times every time-step.

28. A system according to claim 26 wherein following each time-step an array of one or more pointers to integration variables is updated allowing further integration variables to be created between time-steps.

29. A system according to claim 24 wherein said integration function comprises a predetermined number of system element generic descriptions.

30. A system according to claim 28 wherein said predetermined numbers of system element generic descriptions are ordered for use by said derivative function.

31. A system according to claim 29 wherein when an element specific parameter in said calculation is required, reference is made to data in said data file.

32. A system according to claim 1 further comprising a data manager for managing the flow of data to and from said calculating means.

33. A system according to claim 31 wherein said data manager controls the reading of data from said data file and the placing of that data on a virtual data bus.

34. A system according to claims 32 and 29 wherein when an element specific parameter in said calculation is required, reference is made to data on said data bus.

35. A system according to claim 21 wherein said user defined algorithmic

expression comprises arbitrary logic having dependence on none, one or more sets of numeric data and/or syntactic key words.

36. A system according to claim 34 wherein element specific parameters are defined in a said user defined algorithmic expression and comprise executable mathematical equations and respective data relating to a specific class of element.

37. A system according to claim 35 wherein said mathematical equations are guidance laws specific to a said class of element.

38. A method according to claim 21 wherein said calculation means runs as a C++ class and is an object containing the required processing including said generic description.